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## OCCURRENCE OF NATTERER'S BAT IN NORTH WALES.

BY J. BACKHOUSE, F.L.S.

(PLATE IV.)

DURING July of the present year the writer received a box containing thirty-six living specimens of Natterer's Bat (*Vespertilio nattereri*) from North Wales. These were all captured in an old ruin not far from the sea, and, along with a dozen or so more, were taken from a hole in the masonry formerly occupied by Jackdaws. The collection consisted of both old and young, and nearly all have been most carefully preserved.

The occurrence of this comparatively rare British Bat in such large numbers is most interesting, and especially so because the young are of almost all ages—some so very juvenile as to be hardly capable of spreading their membranes.

So little known are the young of this species that a few words by way of description, along with a photographic reproduction of a specimen taken after preservation, may not be out of place.

During life the young Natterer's Bat is darker above than the adult, and noticeably paler beneath—in fact, nearly pure white. The specifically characteristic long spur and hairy margin to the distal portion of the interfemoral membrane is equally observable in the young. Another recognizable point in both old and young

of *V. nattereri* appears to be the presence of hairs upon the feet, a point overlooked by Bell (1874), though pointed out by Lord Clermont in 1859. Some of the young in the "bunch" above referred to were more downy than hairy above, especially about the face.

Natterer's Bat, which is of somewhat local occurrence in our own country, is found distributed through Europe as far as its easternmost confines, but does not appear to range beyond Southern Sweden in the north, or beyond the Alps in the south.





## VARYING FECUNDITY IN BIRDS.

BY BASIL DAVIES.

MR. WARDE FOWLER, in one of his bird stories, describes the uneasiness of a youthful hen Wagtail when she began to ponder on the question, "Why do we wag our tails?"—the moral being, I suppose, that facts come before reasons for facts, and ought to suffice for most of us. Checked somewhat by this allegory, my ideas on the above subject received a fresh impetus when, in 'Summer Studies of Birds and Books,' I read that Mr. Warde Fowler actually felt it his duty to ask and to attempt to answer that very same question which used to trouble his little hen Wagtail. I have no apology of duty to offer for my poor attempts at explanation: I can only say that the subject is one to which very little attention has been given, and that it is one in which a really skilful ornithologist could probably make most successful researches.

The ordinary birdsnesting naturalist regards an abnormal clutch, whether large or small, only with a view of its suitability for his collection. He robs a Nightingale of five eggs and a Partridge of fifteen without attempting to explain why the offspring of the one species is numerically so superior. Some years ago, reviewing my season's "take" of eggs, I felt myself somewhat of a monster when I imagined the table on which my cases lay peopled with those birds whose embryos I had removed from every shell—six Nightingales, a dozen Bullfinches, and so on—though I never took more than one egg from a nest. Consequently, in abandoning collection, I sought for a new interest in eggs to take its place; and this chapter is an endeavour to explain the interest of a different sort that I now take in the nests I find.

There are certain general principles which it is well to keep in mind in this particular branch of bird-study. Such is the rule, that birds do not merely breed so many times a year in the course of nature, but that they feel it their duty not only to

produce a certain number of offspring each year, but also to bring a certain number to maturity. Take the case of a cat. A female may be perpetually running with a male. You drown her kittens; yet she does not again kitten for six months or so. Compare her with a Nightingale. Harry a Nightingale's nest when the fledglings are nearly ready to fly. The bird does not sit down and ejaculate "Kismet," and feebly await the period of migration. She feels desolate without her young ones around her; she knows she has a duty to fulfil, and that the time is short. She begins to bustle about, and in a week she will have started laying again in a safer spot. In a dell at Clifton there were two pairs of Nightingales. Some deadly person of the rabid collector type took each clutch as it was laid, and again he did the same with the second clutches; but the faithful birds each nested a third time, and met with success at last.

There are further a few rules which are useful, and which I must endeavour to state more briefly:—

- (1). The object of the breeding season is to maintain the numbers of each species at an equable level (not necessarily to increase them, though this is sometimes the case).
- (2). By August the numbers of each species are probably treble what they were in April.
- (3). These numbers are subsequently curtailed:—
  - (a). In the case of migratory species, many succumb to the hardships and dangers of the passage.
  - (b). In the case of resident species, many succumb to cold and lack of suitable food during the winter months.
  - (c). Every species alike is liable to losses through accident, from carnivorous birds, and at the hands of the collector, gamekeeper, and other misguided people. These losses, however, cannot compare with (a) and (b).

I will now attempt to treat of the various species more or less in detail.

1. FINCHES, PIPITS, BUNTINGS, and LARGER WARBLERS (such as the Nightingale, Blackcap, &c.).—Throughout the country five eggs is the usual number for all these birds to lay in a clutch. The migratory species in the majority of instances probably confine themselves to one brood, while nearly all the Finches

regularly have a second nest. It is not, I think, difficult to see why they respectively lay their five and ten eggs a season, and neither more nor less. These birds, resident and migratory alike, feed their young on various forms of insect-life—flies, grubs, aphides, the smaller kinds of caterpillars, and the ova of these insects. The two parent birds would be unequal to catering for the wants of a larger brood than five; neither could a hen of this size well produce more than five eggs. Indeed, four is not an uncommon clutch by any means in districts where insect-food is not specially abundant. On the other hand, a Blackcap Warbler must produce five young in a season to prevent her species diminishing; and as the breeding season is curtailed by migration, which the young must be old enough to undergo when the time arrives, we see that a smaller clutch would not be convenient. The resident small birds, however—Finches, Buntings, &c.—are not hampered by the approach of the period of migration, and they indulge in a second brood. It is necessary for them to produce eight or ten of their kind in a season to aid in killing off from the cultivated lands the vast swarms of insects to which the summer has given birth, and which the efforts of the parents when feeding have proved utterly inadequate to cope with. Although the Finches thus produce four or five times their own number, yet by the next spring each family of Finches will usually have dwindled down to a pair once more; for what the birdcatcher spares, God and the winter take.

2. THE TITS AND THE WREN.—These birds during the season feed on a very similar diet to those described under 1, and they lay from six to twelve eggs in each nest, though one cannot say definitely how often they have a second brood. Still, taking into consideration the number of Finches' nests that the small boys destroy, I should be inclined to say that the Tits rear more young than the Finches. They are not the prey of the birdcatcher, who annually robs our woods and fields of tens of thousands of Finches. Why then are they so prolific? Simply because they feed mainly on an insect diet all the year round, and in the depth of winter insect-food is scarce and difficult to obtain. I have found a score of Tits lying dead on the snow in a single walk in a winter that was not specially severe. All were dead from starvation, not from cold; their

bodies were thin and emaciated, the breast-bone often protruding almost through the skin. By training a terrier to find the dead bodies, one gets some slight idea what an ordeal a hard winter is to our birds. Another point is that eight young Tits would hardly require more food than five greedy little Robins, and so the labours of the parents in the two species would not differ appreciably.

3. **SMALLER WARBLERS** (Chiffchaffs, Willow Warbler, &c.).—Here again it is no more difficult to feed eight small Warblers than five large ones. A Wood Wren usually lays six or seven eggs; she can rear her family as easily as a Redstart can rear five; and these species succumb in greater numbers during migration than their more stalwart relations.

4. The **NIGHTJAR** lays but two eggs, probably because a huddled mass of half a dozen gaping youngsters could hardly fail to be distinguished, seeing that she incubates on the bare ground.

5. The **WRYNECK** lays nine eggs as a rule. This bird has a great advantage over the other insectivorous birds, because it feeds largely on ants. It is structurally adapted for searching tree-trunks, and if it finds the supply on the trees run short it has only to preserve a few ant-hills to obtain an unbounded quantity. I observed one pair very carefully when feeding their young, and they seemed to rely almost wholly on some neighbouring ant-hills. When I cut one open for them they had a joyous quarter of an hour, and did great execution.

6. **DOVES AND PIGEONS**.—I have only the old hackneyed explanation for the unvarying pair of eggs laid by these birds, *i.e.* that they are conspicuous among birds for their tender affection to their mates, and that the eggs always hatch out male and female in the same nest. I have had no opportunities of verifying this theory among the wild kinds, but it is undoubtedly true in most instances of the domestic Pigeon.

7. **PLOVERS AND CERTAIN OTHER WADERS**.—These are peculiarly interesting birds. They build in a very dangerous situation—on the ground in tolerably open and exposed places. This occasions three difficulties; for, to balance these dangers and the probable resulting losses,

(1). The number of young must be passably large.

(2). The young must be able to run when hatched.



- (3). If (2) be necessary, the egg must be abnormally large for the size of the bird.

Everyone knows how wonderfully these three difficulties are surmounted.

8. **CRAKES AND RAILS.**—These birds lay from seven to nine eggs in well-concealed situations amongst the stems of standing grass or grain. Owing to the cover afforded by the stems, the young need not be so large when hatched as the young of the Plover; consequently the eggs are much smaller, and the hen can incubate a greater number. At the same time it is imperative that she should produce a good clutch, for very many nests are destroyed when the grass comes to be mown. The birds are also migratory, and encounter the usual dangers during passage.

9. **GAME BIRDS** lay a good many eggs, as the situation of their nests lays them open to many enemies—Stoats, Crows, &c. Further, I should not be surprised to learn that they were originally less prolific before they were persecuted under the name of sport. At any rate, the least persecuted species, the Ptarmigan, as a rule lays the fewest eggs.

10. Coming to the order of **NATATORES**, I plead guilty to a very small experience of these birds. It is obvious enough why Razorbills and Guillemots lay but one egg. It is well known that their single egg is of such a tapering form that a gust of wind, instead of sweeping it from the ledge of rock on which it is laid, merely causes it to twist round in a circle with the thin end as centre. If there were more than one egg in a clutch, these gyrations would result in disaster, and a Guillemot's breeding station in a high wind would indeed be a curious spectacle.

It may further be noticed that the largest clutches in this order are those laid by the Teal and Wild Duck, whose nests are accessible to many enemies, and who are not altogether free from the molestation of man.



"THE LEATHERY TURTLE" (*DERMOCHELYS*  
*CORIACEA*).

BY W. L. DISTANT.

(PLATE V.)

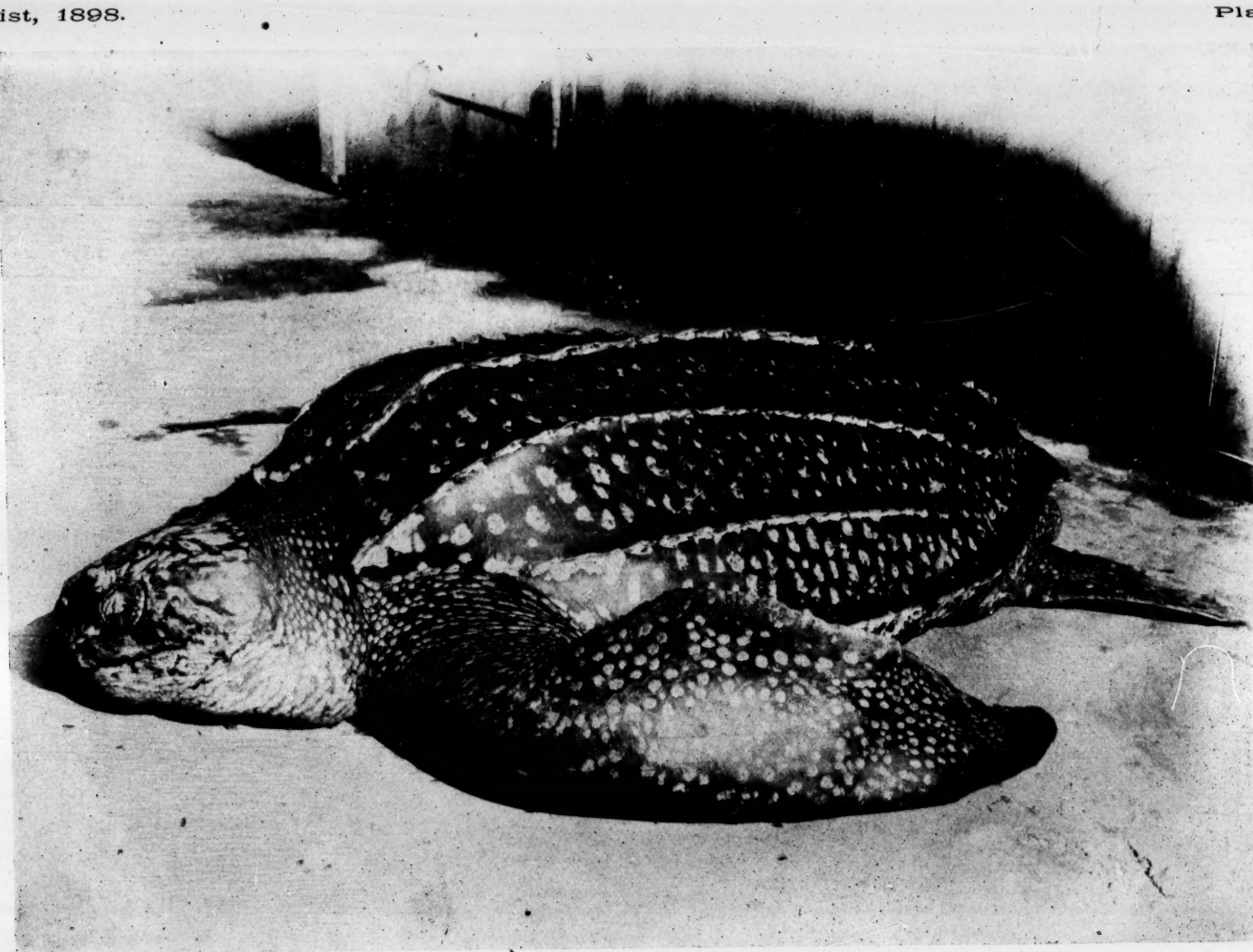
WHEN visiting the South African Museum at Cape Town last October, Mr. Peringuey directed my attention to the carapace of a fine specimen of this Turtle, which had been captured alive on the 20th April, 1896, in Table Bay, on Woodstock Beach, in about two feet of water. It was presented to the Museum by my friend Mr. Casper Keytel, of Cape Town, who had it photographed while in the living condition, and who presented me with a copy of the photograph, which is here reproduced (Plate V.). Such photographs of rare living animals are, zoologically, most important, and prevent misconceptions too often consequent on illustrations taken from Museum specimens. Of this Turtle few really good illustrations are to be found; most of the popular ones—even those in the 'Boston Standard' and "Royal" Natural Histories—are taken from Brehm. Tickell took a drawing from life, but it is somewhat indifferent.

According to Dr. Günther the species is spread throughout almost all the seas of the tropical and temperate regions, having been found in the Mediterranean, on the South Coast of England, in the West Indies, at the Cape of Good Hope, on the coasts of the United States, in Chile, Japan, and the coast of British India.\* It appears to be scarce on the Australian coasts. McCoy figures a specimen which he describes as "the only one I have known to have occurred on the shores of the colony."† Bell includes the species in his 'British Reptiles' on the authority of Borlase and Pennant.‡ The late Prof. Agassiz, however,

\* 'Reptiles of Brit. India,' p. 55.

† 'Prodromus Zool. Victoria,' Dec. xi. p. 1, pl. 101.

‡ A specimen was recorded as found in Bridlington Bay, Yorkshire, on Oct. 25th, 1871 ('Zoologist,' 1872, p. 2907).



LEATHERY TURTLE (*Dermochelys coriacea*).



expressed his doubts as to whether the specimens collected in these various parts of the world really belonged to one species.\* The same authority considered, from a critical examination of the localities where the species is found, and from its frequency in some parts of the Atlantic Ocean, whilst it is only met with accidentally in others, that "it is plain that the West Indies is its home, and that it is not indigenous to Europe, since in three centuries it has not been observed more than nine times in Europe, whereas it is seen at all seasons about the Bahamas."†

An interesting account is given by Major S. R. Tickell, which has been more than once reproduced, of a female captured on the coast of Tenasserim. "She was captured Feb. 1st, 1862, near the mouth of the Té River, on the sandy beach of which she had deposited about a hundred eggs, when she was surprised by a number of Burmese fishermen who had been lying in ambush near the spot (a favourite resort of the Common Turtle, *Chelonia virgata*), and, after a desperate struggle, was secured. Her entire length was six feet two and a half inches.

"The strength, aided of course by the enormous weight of the animal, was such that she dragged six men, endeavouring to stop her, down the slope of the beach, almost into the sea, when she was overpowered by increased numbers, lashed to some strong poles, and brought into the village by ten to twelve men at a time.

"The eggs were spherical, of  $1\frac{5}{8}$  in. diameter, and were as palatable as those of the River Tortoise are *nauseous*. Besides those the animal had laid in the sand, there must have been upwards of a thousand in her ovaria, in all stages of maturity. The flesh was dark and coarse, and very few of the crowds of Burmans assembled at Té to see the animal would eat any of it."‡

According to the late Prof. Duncan, they make a roaring noise under certain circumstances, and hence have to be included in the genus *Sphargis*.§ Aflalo, describing a pair of these Leathery

\* 'Contr. Nat. Hist. U. S. Amer.' vol. i. p. 372.

† *Ibid.* p. 374.

‡ 'Journ. As. Soc. Beng.' 1862, p. 367.

§ As the construction of this generic term implies, the species is now included in the genus *Dermochelys*.



Sea-Turtles from Thursday Island, states that "the shell was not harder than a new saddle." \*

In compiling these few facts and opinions relating to this scarce and interesting animal, it is evident that much more is to be learned as to its habits; while the suggestion of Agassiz that there may be more than one species included under the same specific name is worthy of attention.

\* 'Sketch Nat. Hist. Australia,' p. 188.



## NOTES AND QUERIES.

## MAMMALIA.

## CARNIVORA.

**Polecats in Suffolk.**—I have to record the capture of three more specimens of *Mustela putorius* in North-west Suffolk, two of which I examined in the flesh at Bury St. Edmunds on Nov. 16th, and could have purchased. All three came from the headquarters of this species in the Mildenhall district.—JULIAN G. TUCK (Tostock Rectory, Suffolk).

## RODENTIA.

**Notes on the Bank Vole.**—The Bank Vole (*Microtus glareolus*) from Kent, referred to by Mr. Oxley Grabham (*ante*, p. 477), is undoubtedly a large one, exceeding in length by half an inch the longest specimen from East Suffolk, whose dimensions I have taken. For the purpose of comparison it may be worth while recording the dimensions of some of the largest examples, among a number of individuals from the parish of Blaxhall, in Suffolk, carefully measured at various times. All the specimens whose measurements are here given exceed the average size of this little animal.

	Head and body. (Tip of nose to vent.)			Tail. (Vent to extremity of hair or tip.)			Total length.	
	in.	lin.		in.	lin.		in.	lin.
Male.....	4	0	...	2	0	...	6	0
Do.....	3	10	...	1	10	...	5	8
Do.....	3	11	...	1	6½	...	5	5½
Female.....	4	0	...	1	9	...	5	9
Sex not noted ...	4	2	...	1	7	...	5	9

The delicate fawn or orange tint with which the under surface of the body of adults is at times found to be suffused appears to me to be most pronounced in the winter, when the fur is in its best condition; but to determine this point further observation is needed. Two females caught here in January had the fur upon the abdomen beautifully stained with bright fawn-colour, while a male also taken in January had very little of that tint. Another male, in the month of February, was only slightly tinted. A third male, caught in March, was also but faintly stained with

pale yellowish fawn in the middle of the abdomen; but another at the same season had all the under parts, excepting the inside of the thighs and fore legs, strongly tinged with yellow fawn. Of thirteen males and one female examined during the month of May and the latter part of April, not one showed much trace of this peculiar flush of warm colour; and in a female taken in July it was only slightly indicated. These animals are particularly fond of apples, and both Bank Voles and Long-tailed Field Mice often find their way into a fruit-house here, which is situated in the midst of a plantation, the former regaling themselves on the apples, while the latter confine their attention more particularly to the filberts and walnuts. During the winter Bank Voles often visit and even take up their abode in outbuildings where roots, bulbs, vegetable seeds, &c., are stored; yet those I have kept in cages would not touch carrots, parsnips, or crocus bulbs. In addition to the different kinds of food enumerated in Mr. Harting's article on this animal (Zool. 1887, pp. 369, 370), mine would also eat the berries of the holly, and of *Cotoneaster microphylla*, as well as the leaves of the dandelion. —G. T. ROPE (Blaxhall, Suffolk).

## CETACEA.

**Porpoises at Great Yarmouth.**—These animals (*Phocæna phocæna*) have fared badly here through some reason—perhaps having become entangled in the fishermen's nets, where they died. Twelve dead Porpoises have come on shore a few miles north of the town in the latter part of October and beginning of November.—A. PATTERSON (273, Southtown, Great Yarmouth).

## AVES.

**Food of the Redwing.**—I examined the other day the crops and gizzards of several Redwings (*Turdus iliacus*), which have been very numerous. They all contained a goodly number of caterpillars, and the larvæ of some beetle. I often think not half enough attention is paid to the food of birds by those who have the chance of dissecting them, for it is thus that we are enabled to judge of their usefulness or the reverse.—OXLEY GRABHAM (Heworth, York).

**Barred Warbler in Lincolnshire.**—I shot an example of the Barred Warbler (*Sylvia nisoria*) on Sept. 5th last from a bunch of brambles in a ditch not far from the coast at North Cotes. The bird was a young female, showing no trace of barring except on the tail-coverts, and having the irides brown. The weather at the time was fine and very hot, with a light east wind. With the exception of a single Willow Wren and a young Spotted Flycatcher, no other migrants were seen on that day. This bird is an addition to the Lincolnshire list, and is, I believe, the thirteenth British

example.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby, Lincolnshire).

**Crossbills in Hants.**—In connection with Mr. G. C. Corbin's interesting account of the occurrence of Crossbills (*Loxia curvirostra*) in South-west Hants (*ante*, p. 482), it may be worth noting that I saw a pair of these birds in the south-east part of the New Forest, close to a Scotch fir plantation, on May 19th of this year, a date that makes it probable that they had bred or were breeding in the neighbourhood. The male was in the orange-red plumage.—A. BANKES (Beaulieu, Hants).

**The Gird Bunting in Wales.**—In Capt. Swainson's interesting note on the increase of this species (*Emberiza cirrus*) in Breconshire (*ante*, p. 478), he quotes from the first edition of my 'Manual of British Birds,' completed in 1889. If he refers to the second edition (pt. vi. April, 1898, p. 211), he may be pleased to learn that "in Wales it has decidedly spread of late, and is known to have nested in Brecon, Glamorgan, Cardigan, and Denbighshire, while it has occurred in other parts of the Principality."—HOWARD SAUNDERS.

**Owls and Kestrels.**—Referring to Mr. L. E. Adams's "Plea for Owls and Kestrels" (*ante*, pp. 449, 450), it may be mentioned an order has been obtained by the West Suffolk County Council (a copy of which is enclosed) protecting these birds throughout the year, the taking of their eggs being also prohibited.—JULIAN G. TUCK (Tostock Rectory, Suffolk).

**Scoters in Hants and Isle of Wight.**—Respecting the note by Mr. J. Whitaker as to Scoters in Notts (*ante*, p. 482), I may state that during Aug. 6th and 20th of this year I saw daily from half a dozen to a dozen Common Scoters (*Edemia nigra*) lazily winging their way from Hayling Island (near Portsmouth) to the Isle of Wight, and when on the island, on one or two occasions, I saw them too. They are called in the south "Isle of Wight Parsons," and, I was informed, are found at Hayling Island and the Isle of Wight all the year round, so doubtless breed there. Whilst on an ornithological ramble at Hayling, I observed the Curlew Sandpiper and the Rock Pipit. This also between the dates already mentioned. I had always understood the Scoter was a rare bird to the south, excepting at certain seasons; but that it is not the case is evident from my own observations, and from what I learned as the result of careful enquiries.—W. PERCIVAL-WESTELL (5, Glenferrie Road, St. Albans, Herts).

**Phasianus colchicus in Yorkshire.**—The true old-English Pheasant is getting now so scarce that its occurrence is almost worthy of record. I do not think I have shot more than half a dozen in my life. On Nov. 8th Mr. Richard Hill, of Thornton, near Pickering, very kindly brought me a

fine young cock that had been shot in his covers. It was in beautiful plumage, without a white mark on the neck, it had a conspicuously short tail, and no spurs on either leg.—OXLEY GRABHAM (Heworth, York).

**Nesting Habits of the Moor-Hen.**—In that most interesting book, 'Game Birds and Wild Fowl of the British Islands,' by Charles Dixon, I notice, in the details of the nidification of the Waterhen (*Gallinula chloropus*, Linn.), Mr. Dixon states (p. 82), "When the sitting bird leaves the nest it covers the eggs with bits of vegetation." Now, during the past twenty-six years, I have seen a large number of nests and eggs of this bird (principally in the neighbourhood of York, but also in various parts of the county), and I have never yet found the eggs covered; and my experience is confirmed by several practical field naturalists of my acquaintance to whom I have referred. I am of course quite aware that the habits of birds, like the colours of the plumage, are subject to variation, and perhaps this is a local instance; but that it is the rare exception (if it occurs) and not the rule in Yorkshire, I am firmly convinced. Perhaps other ornithologists will be good enough to inform us how far their experience confirms or refutes Mr. Dixon's statement.—WILLIAM HEWETT (12, Howard Street, York).

**The Birds of the Riffelalp.**—I was much interested in reading Dr. Sclater's paper on the Birds of the Riffelalp (*ante*, p. 474), as I was myself in quest of birds there in 1894, and again in 1896. Two of the birds he has specified I did not observe there—the Water Pipit and the Alpine Accentor—the latter being one of the very few alpine birds with which I am still unacquainted. I did, however, observe the Rock Thrush above the Riffelberg Hotel. The Nutcracker is, as Dr. Sclater observes, a very conspicuous bird of the higher forests of Switzerland, and when chaplain at Gimmelwald I was frequently asked by sojourners at the Pension Schilthorn, "What was the large black bird with the white tail" which they so frequently met in the woods? Until I had myself seen the Nutcracker I was unable to answer. I also observed near Murren that beautiful little song bird, the Citril Finch (*Chrysomitris citrinella*), which has a pleasing song frequently uttered when on the wing. It is much to be wished that some handbook of Swiss birds were available for visitors, as in all my chaplaincies I found that great interest was taken in ornithology by sojourners in the hotels.—CHARLES W. BENSON (Rathmines School, Dublin).

**Birds of Hertfordshire.**—As it is desired by the Hertfordshire Natural History Society to have as complete a list of birds of the county as possible, I should be glad, as Recorder of Birds to this Society, if anybody having notes on any species which have occurred in Hertfordshire would send me particulars of same. —ALAN FAIRFAX CROSSMAN (St. Cuthbert's, Berkhamstead).



List of Birds observed in the District of Moffat, Dumfries-shire, from October, 1896, to February, 1897. — The following (fifty-five identifications) does not pretend to be a complete list of the birds of the district. My notes were made during a residence in Moffat extending over the period specified above, and in my walks for four or five miles around the town I simply made a note of what I saw. The town of Moffat is situated on the river Annan, and lies nineteen miles north-east from Dumfries. It is frequented for its mineral waters, which are saline and sulphurous, and are said to resemble those of Harrogate. The district is hilly and not much wooded.

Mistle-Thrush (*Turdus viscivorus*).—Common.

Song-Thrush (*T. musicus*).—Common, but not quite so plentiful as the former.

Redwing (*T. iliacus*).—Frequently seen in small parties.

Fieldfare (*T. pilaris*).—Very plentiful; hundreds seen feeding on the hawthorn trees close to the town.

Blackbird (*T. merula*).—Fairly plentiful.

Redbreast (*Erithacus rubecula*).—Common.

Golden-crested Wren (*Regulus cristatus*).—Very plentiful, perhaps the commonest bird in the district.

Hedgesparrow (*Accentor modularis*).—Occasionally met with.

Dipper (*Cinclus aquaticus*).—Plentiful.

Long-tailed Tit (*Acredula rosea*).—Parties of twelve or so met with on several occasions.

Great Tit (*Parus major*).—Fairly common.

Coal Tit (*P. ater*).—Also fairly common.

Marsh Tit (*P. palustris*).—Three or four birds only observed among the firs at Evan side.

Blue Tit (*P. cæruleus*).—Very common.

Wren (*Troglodytes parvulus*).—Somewhat plentiful.

Tree Creeper (*Certhia familiaris*).—Scarce; only two or three noticed.

Swallow (*Hirundo rustica*).—Saw a few about the middle of October.

Greenfinch (*Ligurinus chloris*).—Common.

Goldfinch (*Carduelis elegans*).—One or two only observed.

Siskin (*Chrysomitris spinus*).—Fairly common.

House Sparrow (*Passer domesticus*).—Always plentiful.

Chaffinch (*Fringilla cælebs*).—Plentiful.

Linnet (*Linota cannabina*).—Somewhat scarce.

Lesser Redpoll (*L. rufescens*).—A small party occasionally seen feeding on the alders at Annan side.

Bullfinch (*Pyrrhula europæa*).—Single birds occasionally noticed, and on one occasion a party of five.



Yellow Bunting (*Emberiza citrinella*).—Not uncommon.

Reed Bunting (*E. schæniclus*).—One pair only noticed.

Snow Bunting (*Plectrophenax nivalis*).—Small flocks often observed, principally near Hartfell.

Starling (*Sturnus vulgaris*).—Common.

Magpie (*Pica rustica*).—Scarce ; three or four only noted.

Jackdaw (*Corvus monedula*).—Common.

Carrion Crow (*C. corone*).—Fairly plentiful.

Rook (*C. frugilegus*).—Plentiful.

Sky-Lark (*Alauda arvensis*).—Somewhat plentiful.

Kingfisher (*Alcedo ispida*).—Very scarce ; a single bird observed on Annan.

Tawny Owl (*Syrnium aluco*).—Scarce.

Sparrow-Hawk (*Accipiter nisus*).—Very scarce ; a single bird observed.

Kestrel (*Falco tinnunculus*).—Fairly common.

Common Heron (*Ardea cinerea*).—Very plentiful.

Mallard (*Anas boscas*).—Not very plentiful.

Teal (*Querquedula crecca*).—Not very plentiful.

Ring-Dove (*Columba palumbus*).—Fairly common.

Black Grouse (*Tetrao tetrix*).—Plentiful.

Red Grouse (*Lagopus scoticus*).—Very plentiful.

Pheasant (*Phasianus colchicus*).—Common.

Partridge (*Perdix cinerea*).—Very abundant, the district being well suited for Partridges.

Moor-Hen (*Gallinula chloropus*).—Very plentiful.

Coot (*Fulica atra*).—Scarce ; only one observed.

Golden Plover (*Charadrius pluvialis*).—Plentiful.

Green Plover (Lapwing) (*Vanellus vulgaris*).—Very plentiful.

Woodcock (*Scolopax rusticula*).—Scarce ; only one observed.

Common Snipe (*Gallinago cælestis*).—Very plentiful.

Common Gull (*Larus canus*).—Plentiful.

Herring-Gull (*L. argentatus*).—Plentiful.

Lesser Black-backed Gull (*L. fuscus*).—Plentiful.

In the collection of a gentleman I saw specimens of the following birds, all of which were shot in the district :—Long-eared Owl, Short-eared Owl, Bittern, Spotted Crake, and Skua. — BRUCE CAMPBELL (Greenbank Place, Edinburgh).

#### PISCES.

Notes from Great Yarmouth.—Various species of Sharks have been unusually abundant in local waters during the past summer, judging from those seen at less recurrent intervals than formerly. On July 7th a Thresher Shark (*Alopias vulpes*), length 10 ft., turned up on the fish-wharf.

Another reported from Lowestoft on Nov. 7th; length, 14 ft. 4 in. A Sunfish, undoubtedly the Short Sunfish (*Orthogoriscus mola*), reported as taken into Lowestoft on Sept. 14th. A Porbeagle Shark (*Lamna cornubica*), length 7 ft., on the fish-wharf, Oct. 4th; one, 8 ft. long (which I did not see), was landed on Sept. 28th. This species is more often taken than its commoner relative, the Blue Shark (*Carcharias glaucus*), which was at one time the commoner species. Of *C. glaucus* I have not seen an example this season. The largest Mackerel of which I have any local record was brought in on Oct. 21st; length 21½ in., girth 12 in., weight 3 lb. 7 oz. This exceeds my previous record of one in November, 1881, measuring 20 in. long, 10½ in. in girth, and weighing 2¼ lb.—A. PATTERSON (273, Southtown, Great Yarmouth).

#### DISTRIBUTION OF SPECIES.

**Involuntary Migration.**—During a recent visit to the Cape on board the mail steamship 'Norham Castle,' I witnessed an instance of this not uncommon, but too little recorded, occurrence. On Sept. 9th, when in about lat. 22° N., and at about a distance of ninety miles from the coast of North Africa, we encountered a wind blowing from the shore, and bringing fine sand, which afterwards blew from the opposite quarter, still charged with sand, as proved by the opposite sides of objects on deck being alike dusted. Numerous birds visited the ship, such as a couple of Hoopoes, two Yellow Wagtails, a Dove, Chat, Warblers, and other species. All these birds were weary, and frequently alighted on the booms, unalarmed by the presence of the many passengers on deck. They were likewise in a famished condition, as proved by a small moth which also flew on board being instantly seized by a Chat, who carried it to a boom and methodically devoured it. Again, in the evening, a Warbler was chased and struck down almost at my feet by another bird—unidentified—under the awnings of the upper deck, and in the full glare of the electric light; the attack and retreat of the bold marauder being almost instantaneous, but in the presence of the occupiers of many deck-chairs. In the evening I captured Dragonflies in the saloon, and a small bug belonging to the *Capsidæ*.

These birds must have been blown from the shore, and as we were only a spot on the area over which the wind blew, it may well be imagined that a considerable loss in avian life must have ensued. In the morning all had disappeared. On the voyage home, on board the 'Dunvegan Castle,' I saw a fine Coly which had been captured on board during a similar enforced exodus, and which had lived some considerable time in a cage, and was in splendid condition.—ED.

## NOTICES OF NEW BOOKS.

*The Structure and Classification of Birds.* By FRANK E. BEDDARD, M.A., F.R.S. Longmans, Green & Co.

THERE is an ornithology of the field—certainly the earliest form of the study, as proved by the traditions and languages of primitive races; a museum ornithology, which is the parent of most of our avian literature; and an anatomical ornithology, of which many of us have heard too little and studied less. This volume comes in the fulness of time; it supplies a real want to the general zoologist, as well as to the special ornithologist, and is a creation of the Prosector's department attached to the Gardens of our Zoological Society. To the late Prof. Garrod the inception of the work appears to be due—his successor, the late Mr. W. A. Forbes, did not live to carry it out as he intended; the third Prosector, Mr. Beddard, has now completed the task.

In discussing the affinities of birds, and the general belief as to their origin from some reptile stem, Mr. Beddard reviews the evidence which has led some of our highest authorities to detect a nearer kinship with the Dinosaurs than with any other group of reptiles.\* As is now fairly well known, the celebrated tridactyle footprints in the sandstone of the Triassic period which were ascribed to birds are now considered as certainly footprints of Dinosaurs; but Mr. Beddard is cautious in adopting a purely derivative hypothesis. As he writes:—"Still, with so specialized a form as *Archæopteryx* certainly was, and as *Laopteryx* probably was in the Jura, it would not be surprising to meet with genuine avian remains in the Trias. But even then there are undoubtedly Dinosaurs belonging to that period, so that the question of relationship would resolve itself into a common origin, not a derivation of birds from Dinosaurs." Of the relation between

\* Prof. Marsh's Memoir on the "Dinosaurs of North America" was noticed in our last volume (1897, p. 92).

birds and Pterosaurians, particularly Pterodactyles—and Prof. Newton has conclusively shown most interesting resemblances—Mr. Beddard considers the main difficulty “in the way of comparing Pterodactyles and birds is in the fact that both can fly, and that each has acquired the power of flight by a different method. Having acquired the power of flight, it seems clear that certain of the points of resemblance between them may easily be due to that mode of life, and may have been independently arrived at.”

The consideration of the affinities brings us to the much-vexed question of the classification of birds, and “in considering a scheme of classification it is clear that we must bear in mind indications of the descent of birds”; and, in sketching the main outlines of a scheme, “attention must be paid only, or chiefly, to those characters which birds have inherited from their reptilian ancestors.” But here a difficulty arises, if we seek the plane of low level in organization, by a plethora of undoubtedly reptilian characters. For “the few specially reptilian features in the organization of birds have, so to speak, been distributed with such exceeding fairness through the class that no type has any great advantage over its fellows.”

Such discussions and conclusions as the above show the philosophical questions which may be debated and considered by the anatomical details of this volume, with its wealth of illustration. It would no doubt be possible to criticize; fault-finding is a facile occupation, but to recognize the great merits of a book is a more instructive process, even for a reviewer, than the eager quest for an error. We hold with Prof. Nichol on a literary subject—and the same remark applies to science—some “criticism has for its aim to show off the critic; good criticism interprets the author.” This book is a standard contribution to ornithology.

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*Text-Book of Zoology.* By H. S. WELLS, B.Sc. Lond., &c.,  
and A. M. DAVIES, B.Sc. Lond. London: W. B. Clive,  
University Correspondence College Press.

THIS is a new edition, “almost completely” rewritten, of Wells’s ‘Text-Book of Biology,’ published some five years back.



We are, however, somewhat puzzled by the Preface as to the authorship of this volume. Thus we read:—"Only one chapter in the book (Chapter XIV.) remains practically unaltered from the first edition, so that while the credit for the general plan of the work belongs to Mr. H. S. Wells, no responsibility attaches to him for any part of the present work." Who then is the writer who has "almost completely rewritten the book"? for we are told Mrs. Davies has supplied the diagrams to this volume of "the University Tutorial Series."

The "type-system" is employed throughout, pages 1-134 being devoted to a very thorough exposition of the Rabbit. We cannot devote a space in these pages sufficient to adequately notice the anatomical and physiological treatment of the subject, but those of our readers, who do not pay much attention to those important aspects of zoology, will still find many interesting conclusions in the life-history of the animal. Many points, often overlooked, are brought out very clearly and in plain language. "Thus the Rabbit is dependent on the plant kingdom for the maintenance of its life. So, too, are all animals, directly or indirectly; for, though one animal may feed on another, and that in turn on another, this process cannot be carried on indefinitely: sooner or later we must come down to an animal which is a plant-feeder. In the long run all animals are dependent on plants for both the *material* and the *energy* of their bodies." Again, in rightly estimating a subject so often misunderstood as "variation," it is well to bear in mind that "it is probable that out of the enormous numbers of Rabbits that live or have lived no two have ever been *exactly* alike." Perhaps, however, a strong and excellent theory is made too much a fact, when we are told that the upturned white tail of the Rabbit "serves as a 'recognition mark' to guide the young when during feeding an alarm is given, and a bolt is made for the burrows." This is a *probability*; and even Wallace does not confine its efficacious protection to the young alone, but to those "more remote from home," as well as to the young and feeble.

Part II. is devoted to the "Lower Vertebrata," of which the Frog, Dogfish, and Lancelet are taken as types; Part III. treats of the "Development of Vertebrata"; and Part IV. deals with the "Invertebrata," the Slipper-Animalcule (*Paramecium aurelia*),



the Fresh-water Polype (*Hydra vulgaris*, *H. viridis*, *H. fusca*), Earthworm, Fresh-water Mussel, and Crayfish being used as types.

An Appendix pertains to "General Advice to the Student." The first advice to the student is on "the importance of some preliminary reading before dissection is undertaken." Against this may be instanced Scudder's historical narrative of his introduction to the study of a fish by Agassiz. An axiom, however, with which all will agree, which should be pondered by the young, and remembered by the old, is to avoid the common and easy delusion that one "really *understands* some statement, because he can *remember the words* of it."

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*The Wonderful Trout.* By J. A. HARVIE-BROWN. Edinburgh: David Douglas.

"THE Wonderful Trout" of Mr. Harvie-Brown has always had admirers; old Isaac Walton declared "he may be justly said, as the old poet said of wine, and we English say of venison, to be a generous fish, a fish that is so like the buck that he also has his seasons"; while in England at least the Trout stream and the cricket field are among our dearest experiences and reminiscences of country life. We quite recently (*ante*, p. 444) noticed another work on the same subject, but that referred principally to fish in British streams, while the present small volume is all Scotch,—fish, waters, author, publisher.

When a naturalist like Mr. Harvie-Brown writes on a subject of special interest to anglers, the zoologist may safely rely upon finding the record of many facts and observations which an ordinary fisherman would pass unheeded as almost outside the domain of sport. But to catch your fish you must know him, his food not alone, but his time and manner of eating it, his haunts, his habits, his idiosyncrasies; in fact, he who knows his Trout best should fill the largest basket. Thus we may leave the author's successful advocacy of "up-stream" angling, and the more startling disuse of the landing-net, as solely appertaining to the "gentle craft"; and as the angler fishes the stream for Trout, so must we search the book for natural history lore.

As regards the age of Trout, a personal experience is given of one which had passed nearly twenty years in confinement. Trout show decided preferences for colours; but our author does not consider, as many do, that a certain colour is more deadly because more readily seen, but rather "We believe, in most circumstances, the sky above and the water combined gives a better guide, and that the converse of Stewart's theory is the true one, *viz.* that 'a certain colour is more deadly because *less* readily seen,' and that movement is the more visible sensation to the eye of a fish." And further on we read that anglers of experience and with sufficient scientific interest in their practice believe in "a dark fly in a dark water and sky, and a light fly in a bright water and sky." We will only give another quotation: "If a large Trout is on the prowl, or has taken up his special feeding-lie in a stream, he commands the 'key of the situation,' and is not slow to repel all minor fry that come within many feet of his 'monarchical throne.' This we have often seen when looking down into the clear water from a height. Even before taking the bait himself he will chase away the small fry, *i. e.* if the bait is lying stationary at his very nose."

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*Faune de France, contenant la description des espèces indigènes disposées en tableaux analytiques et illustrée de figures représentant les types caractéristiques des genres.* Par A. ACLOQUE. Paris: J. B. Ballière et Fils.

THIS is the third volume of a series descriptive of the Fauna of France; those preceding were principally devoted to the Insecta. The present volume treats of the "Thysanoures, Myriopodes, Arachnides, Crustacés, Nemathelminthes, Lophostomés, Vers, Mollusques, Polypes, Spongiaires, and Protozoaires."

The method pursued is a synoptical one. The structural characters are given from class to species, very many of the genera are figured,—in fact, there are 1664 figures in the volume now before us,—and the most salient characters are sought to differentiate throughout. The labour expended in this work must be prodigious; for what monographer does not remember the travail incidental to the formation of a synoptical key to

genera and species? Here a whole fauna is treated in the same manner. It is a purely technical work, embracing classification, differential enumeration, and nomenclature, and many a young English zoologist may find himself helped over several stiles by the possession of this small and not expensive book. The illustrations are very clear, while the course followed throughout reminds us of the method of a well-thumbed volume of our early days—Stephen's 'Manual of British Beetles.'

We sometimes meet with antedated books, but this bears the date of 1899.

## EDITORIAL GLEANINGS.

THE following extract from the Address of the Chairman, Dr. P. L. Selater, on opening the Seventh Session of the British Ornithologists' Club, refers to the successful completion of a great conception :—

“As the Editors of ‘The Ibis’ have already remarked in their preface to the volume for the present year, one of the leading ornithological events of 1898 is the completion of the ‘Catalogue of Birds.’ The twenty-sixth volume of this work, prepared by Dr. Bowdler Sharpe and Mr. Ogilvie Grant, the only one required to finish the series, will, I am assured, be laid before the Trustees at their meeting on the 22nd inst., and be ready for issue very shortly afterwards. Thus, after a period of twenty-five years, this most important piece of ornithological work has been brought to a conclusion. No human product is perfect, and the Catalogue has been, and will be, the subject of many criticisms. One obvious defect in it is its want of uniformity, the various authors having been permitted, owing to the wise discretion of the authorities, very liberal opportunities for the expression of their own views in their respective portions, although a general adherence to one plan has been rightly insisted upon. But when the enormous amount of labour required for this work and the absolute necessity of employing more than one author upon such a huge task are considered, it will be obvious that greater uniformity was practically unattainable. In the case of the ‘Catalogue of Reptiles and Batrachians,’ where the series of specimens and species was not so large, the herpetologists are fortunate in having had the whole of the work performed upon a uniform system by the indefatigable energy of a single naturalist. The ‘Catalogue of Birds,’ as complete in twenty-seven volumes, gives us an account of 11,614 species of this Class of Vertebrates, divided into 2255 genera and 124 families. It has been prepared by eleven authors, all Members of the British Ornithologists’ Union, and, with one exception, I believe (who is not a resident in England), now or formerly Members of this Club. I think it will be universally allowed that we have, in this case, a great and most useful undertaking brought to a successful conclusion.”

WE have received the Report of Trustees for the year 1897 of the Australian Museum, Sydney. Commercial prosperity reacts in a beneficial manner on scientific institutions. There must be a revenue to make



grants possible, and if, as we know, the trader usually precedes the missionary, so commerce provides the funds for science. In that spirit we may well say "Advance Australia" when we read as follows:—

"No fully organised collecting expeditions have been despatched, as the Trustees had not sufficient available funds for this purpose, but a few short trips were made by members of the staff, partly at their own expense. The most important of these was made possible through the kindness of Mr. Septimus Robinson, who invited the Trustees to send a collector to Buckinguy Station for a fortnight, and gave him every assistance and generous hospitality, the only expense to the Trustees being the railway fares and the preserving material. A number of much-needed specimens were obtained in this way, and the thanks of the Trustees are due to Mr. Robinson for his assistance. A very great need on the Museum staff is that of a trained collector. The stock of duplicate specimens is very low, and it is difficult to replenish the exhibited collections as required, and impossible to deal fully with other Museums in the way of exchange. At present the funds at the disposal of the Trustees will not permit of such an appointment being made, and this is the more to be regretted when it is seen that Museums and Institutions in other countries are sending their collectors to Australia and taking the best specimens out of the country, so that Australian types are largely located in London, Norway, &c."

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A FRENCHMAN, M. Bourdarie by name, is agitating just now in the interests of the Elephant. He is appealing to the French Government and the King of the Belgians for support. Every year 40,000 Elephants are killed in Africa for the sake of their ivory, and M. Bourdarie fears that, like the Buffaloes in America, these useful animals will become exterminated if something is not done to limit the number killed. He considers that the Elephant instead of being destroyed should be protected to serve the future agriculturists of Central Africa, as the Elephant is the only animal that can work in these regions. In the meantime ivory is still an important article of commerce in Central Africa, and the problem is how to get the ivory without killing the Elephant.—*South Africa*.

---

AN extraordinary catch of Sprats occurred on Thursday, Nov. 17th, just west of Shoreham Harbour, about fifteen boats being kept going throughout the morning and afternoon bringing the fish to the shore. In nearly every instance the boats were loaded to such an extent that had there been any sea on to speak of they would undoubtedly have been swamped. In one case a boat containing between fifty and sixty bushels burst. The Sprats were unusually large. The last catch of any similar magnitude off Shoreham occurred in 1878.—*The West Sussex Gazette*.

THE London steamer 'Oceana,' which was returning from an interesting scientific expedition off the west coast of Ireland, was driven into Cork Harbour for refuge during the recent gale. The object of the expedition, which was under the auspices of the British Museum, was to explore the ocean within 200 miles off the coast of Cork and Kerry for specimens of aquatic life, and whatever general knowledge could be obtained. Mr. Murray, who had charge of the operations, stated to a correspondent at Cork that the expedition had been most successful. Soundings were taken at various depths to a maximum of 2000 fathoms, as far as 200 miles west of the Fastnet, and several interesting and some curious specimens were procured. These will be arranged and classified, which must occupy a considerable time, and a report will then be written upon them for the British Museum.—*Daily Mail*.

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THE example of Mr. Rhodes is to be followed in Australia, the Victoria Government having determined to reserve 91,000 acres at Wilson's Promontory as a huge national Zoo wherein all the native animals, which will otherwise soon become extinct, will be able to live and breed. It is, by the way, an example which might well be followed nearer home. The English "fauna" is not very extensive, but it is exceedingly interesting, and is rapidly diminishing. There is plenty of land in the island which would answer the purpose admirably, and which is useless for almost everything else.—*Globe*.

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WE have already (*ante*, p. 449) called attention to a proposed Zoological Society of Edinburgh. We are now glad to learn that as the result of a meeting held last week a committee has been appointed to formulate a scheme for a zoological garden in Edinburgh. It was mentioned at the meeting that letters asking information had been addressed to the secretaries of various existing gardens, and it appeared to be the opinion that the two best suited to the requirements of Edinburgh were Dublin and Bristol, each of which has an income of about £3000 a year from an average of about 120,000 visitors. Prof. Cossar Ewart, in strongly commending the proposal, spoke of it as being painful to think that many children grew up in Scotland without having ever seen many of the animals they heard so much about. Forty years ago there was a zoological garden at Edinburgh, but it collapsed for lack of support from the public.

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MR. SYMINGTON GRIEVE has again published "Additional Notes on the Great Auk or Gare-fowl (*Alca impennis*, Linn.)," reprinted from the 'Transactions of the Edinburgh Field Naturalists' and Microscopical

Society.' These notes are written up to 31st July, 1898. We previously referred to his last census of twelve months ago ('Zoologist,' 1897, p. 533). He is now able to increase his enumeration of birds represented by the following remains:—

Skins	...	...	...	80 or 82.
Skeletons, more or less complete				23 „ 24.
Detached bones	...	...		862 „ 874.
Physiological preparations	...			2 „ 3.
Eggs	...	...	...	71 „ 72.

SIR JOHN MURRAY has presented to the British Museum the first set of the Natural History Collections made by Mr. C. W. Andrews during his year's stay on Christmas Island, 200 miles south of Java.

W. WESLEY & SON, 28, Essex Street, Strand, London, have just issued a new Catalogue, being No. 132 of their Natural History and Scientific Book Circular, which gives a descriptive and classified list of 1500 books and pamphlets on the Natural History of Great Britain and Ireland. We believe that it is the first catalogue of this character which has been published. The arrangement under the names of the English counties, Wales, Scotland, and Ireland, will be found of interest to collectors of local fauna and flora.

WE regret to announce the death of Professor George J. Allman, M.D., F.R.S., formerly Regius Professor of Natural Science in the Edinburgh University, which took place at Ardmere, Parkstone, Dorset, on Nov. 24th. Professor Allman, who was born in Cork in 1812, was the eldest son of Mr. James Allman, of Bandon, County Cork. He was educated at Belfast Academical Institution, and resolved on studying for the Irish Bar. Before, however, he had completed his terms, the love of natural science caused him to abandon law for medicine, and he accordingly graduated in Arts and Medicine in the University of Dublin in 1844. In the same year he was appointed Regius Professor of Botany in the University, and gave up all idea of practising medicine as a profession. In 1854 he was elected a Fellow of the Royal Society, and in 1855 he resigned his professorship in the University of Dublin on being appointed Regius Professor of Natural History and Keeper of the Natural History Museum in the University of Edinburgh. This post he held until 1870, and shortly afterwards the honorary degree of LL.D. was conferred upon him by the Edinburgh University. Professor Allman devoted the greater part of his life to investigating the lower organisms of the animal kingdom. The large col-

lection of *Hydroida* made during the exploring voyage of the 'Challenger' was assigned to Professor Allman for determination and description. He has published the results of his original investigations in the Philosophical Transactions, the Transactions of the Royal Society of Edinburgh, of the Royal Irish Academy, and of the Linnean and Zoological Societies of London.

We take the above from an obituary notice in the 'Daily Chronicle.'

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At a meeting of the British Ornithologists' Club, on Oct. 19th, Mr. G. H. Caton Haigh exhibited and made remarks upon a Warbler (*Luscinola schwarzi*, Radde), which he had shot on the first of that month near North Cotes, Lincolnshire. The large bastard-primary easily distinguished the members of this genus (and those of *Herbivocula*) from the *Phylloscopi*. The summer home of *L. schwarzi* appeared to be in South-eastern Siberia, and reached about as far west as Tomsk, according to Godlewski, who had mentioned the powerful note of the bird; this was described by Mr. Haigh as disproportionately loud, and it led to the thorough beating-out of the hedge in which the bird was skulking. It would be remembered that easterly gales had prevailed for a considerable time. So far, *L. schwarzi* seemed not to have been previously recorded within the European area. A coloured figure of the specimen was to appear in the next number of the 'Ibis.'

---

W. J. W., writing in the 'Westminster Gazette' on the consternation among lovers of animal life at the Report of the Select Committee of the House of Commons upon the Science and Art Department's Museums advising the abolition of the Frank Buckland Collection, observes:—It is common knowledge that Frank Buckland intended the museum as an educational centre, and left a sum of money to ultimately endow a Lectureship in connection with it, which has not yet been brought into existence. To this it may be added that no post is likely to be created according to the terms of the will, for the trustee decamped with the money. Unless, therefore, the Government wakes up to its responsibility with regard to the *direct* advancement of many industries dealing with food supplies, and consequently grafted upon natural history, and begins its work with establishing a proper economic museum bearing upon fisheries, and using the Buckland bequest as a nucleus, this interesting series of specimens, with their old associations—unless some private benefactor comes forward—must be for ever lost to the country and to the admirers of one of the last naturalists of the old school.





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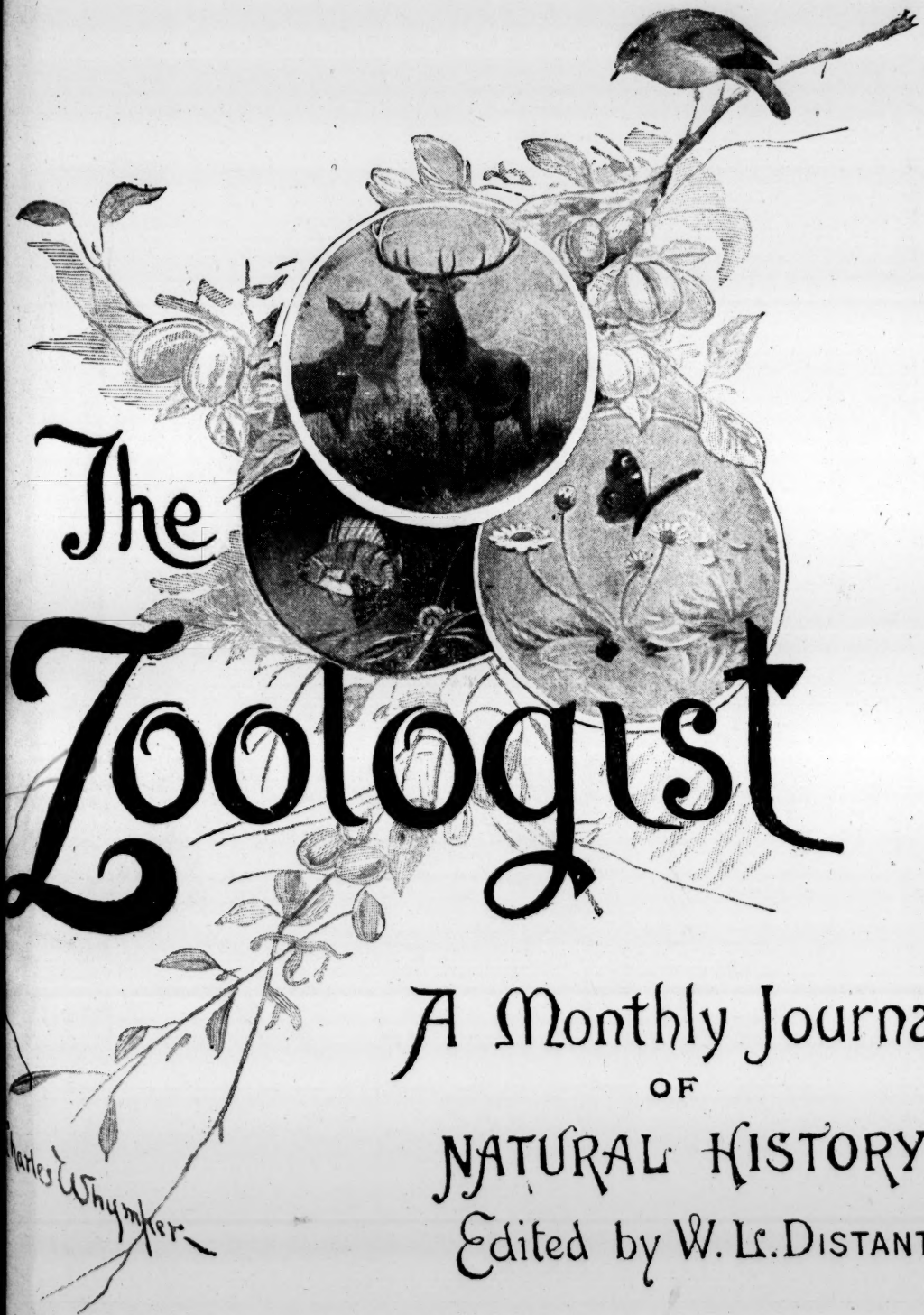
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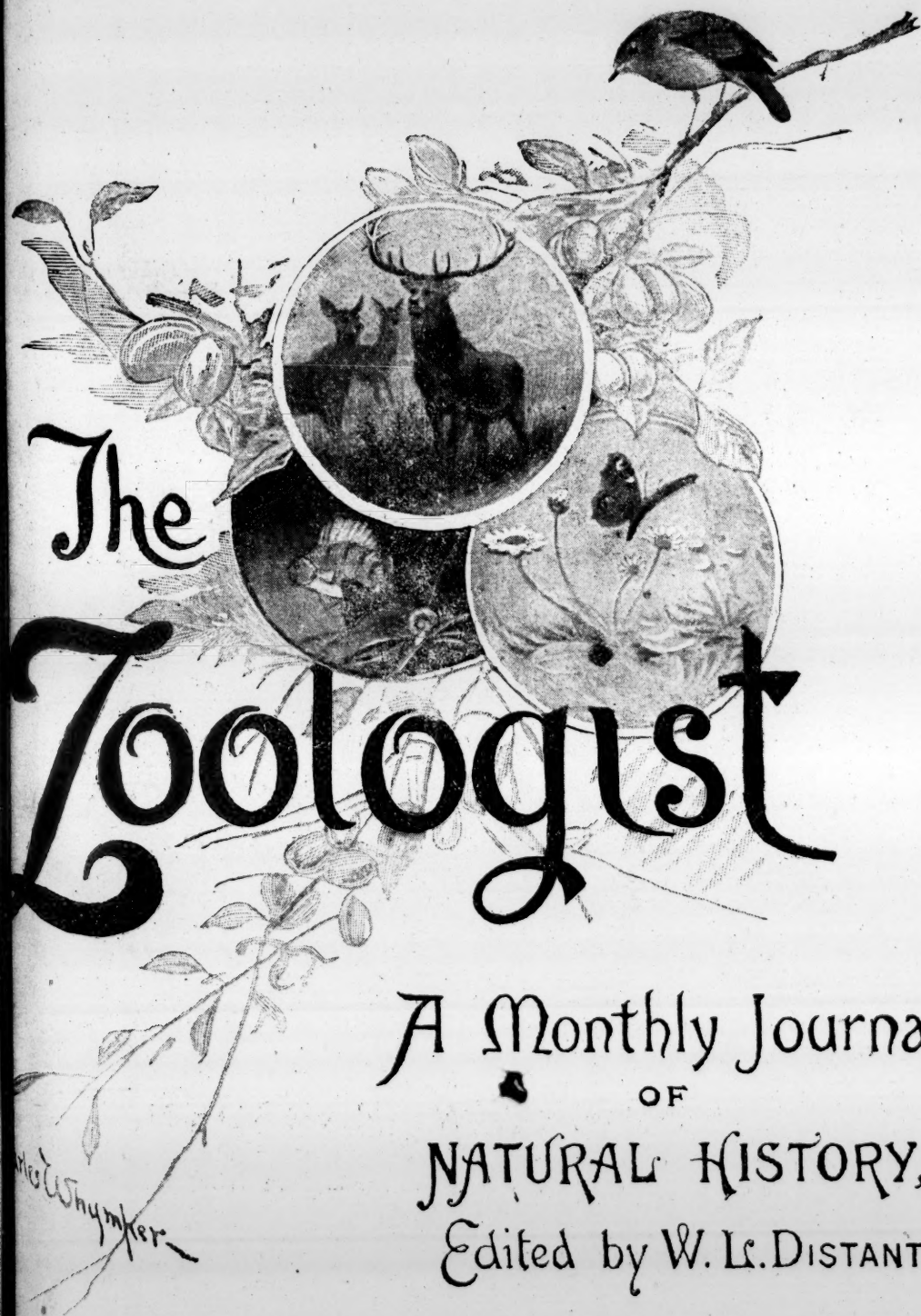
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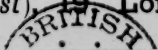
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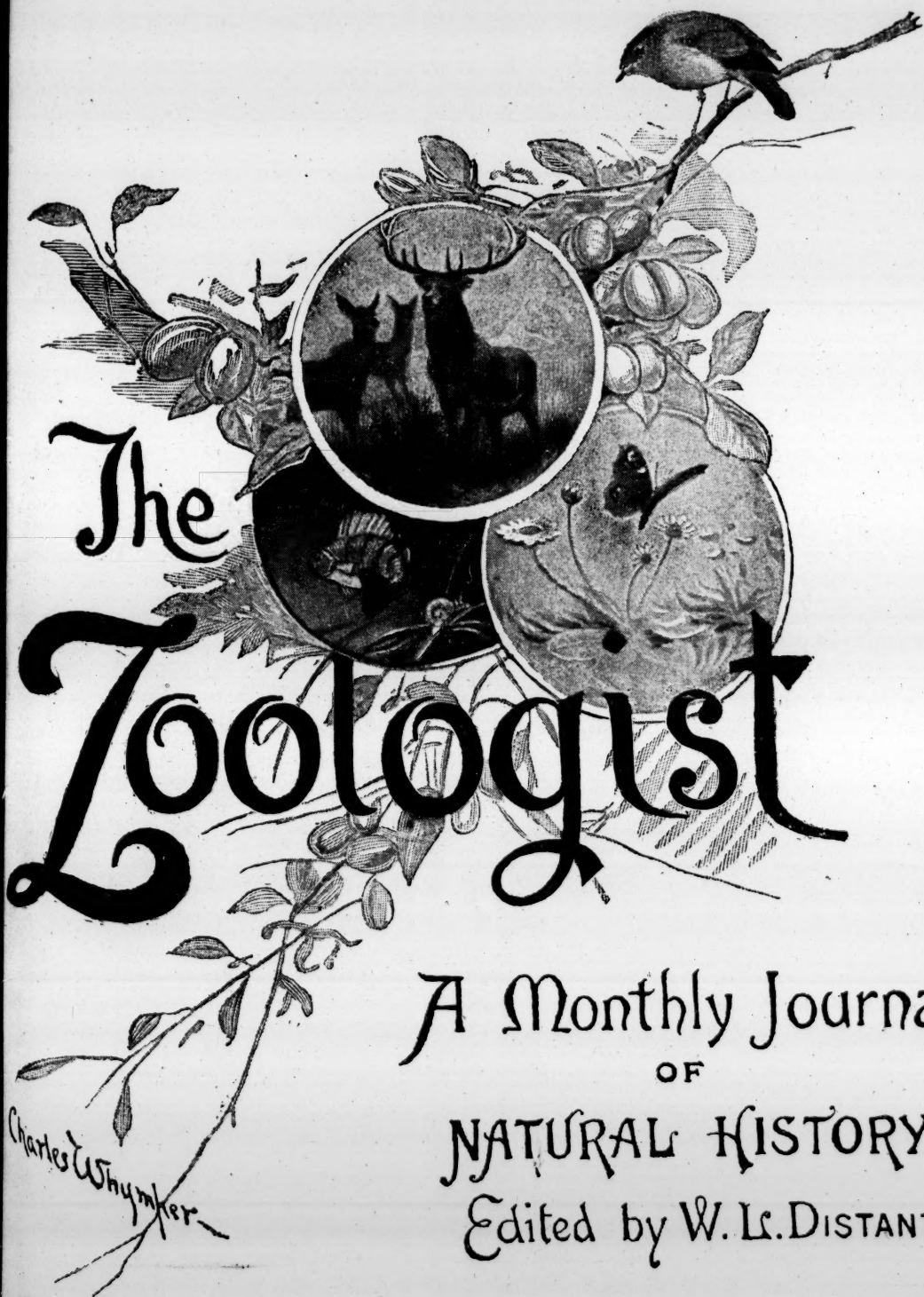
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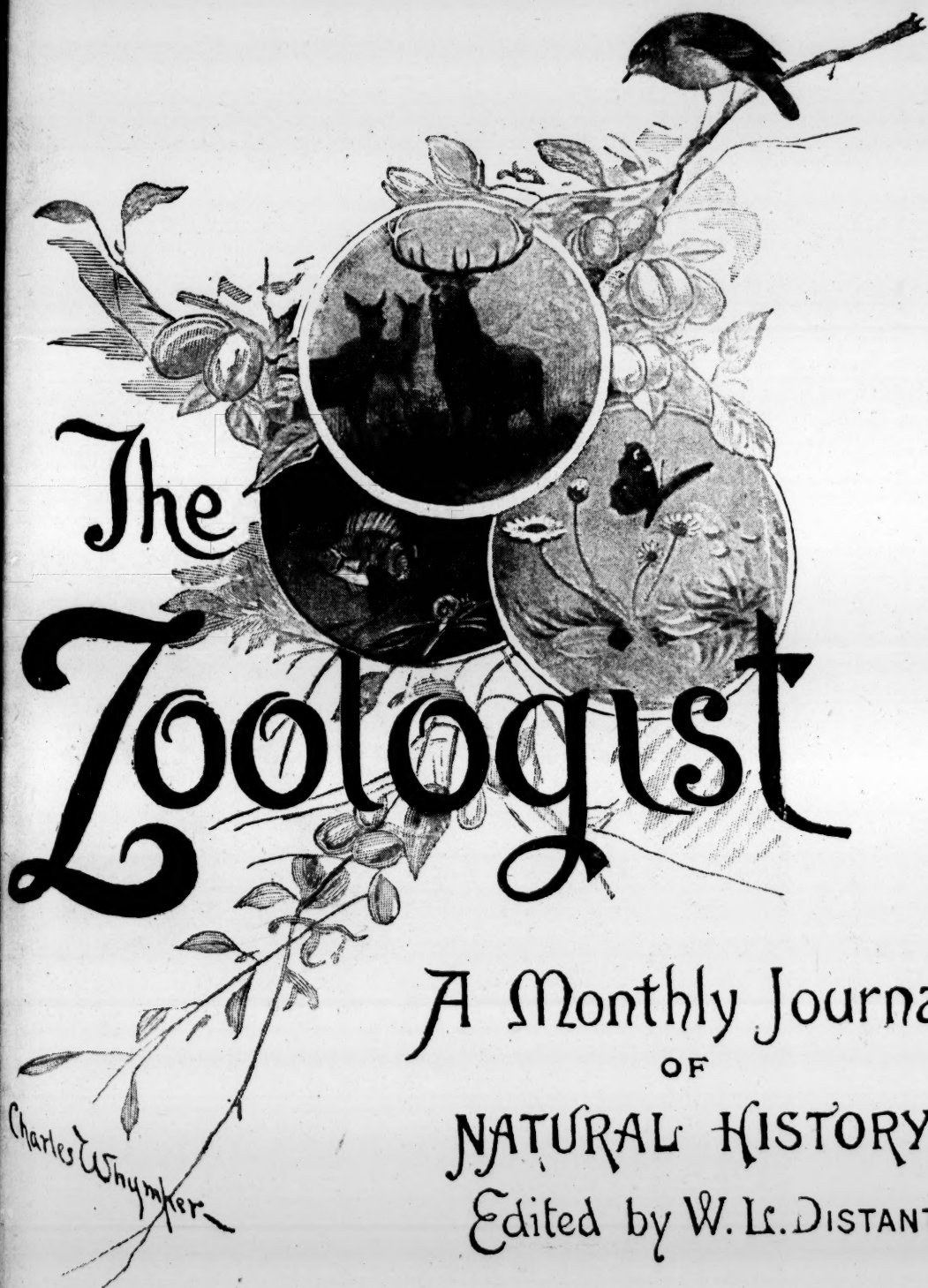
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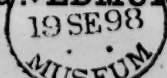
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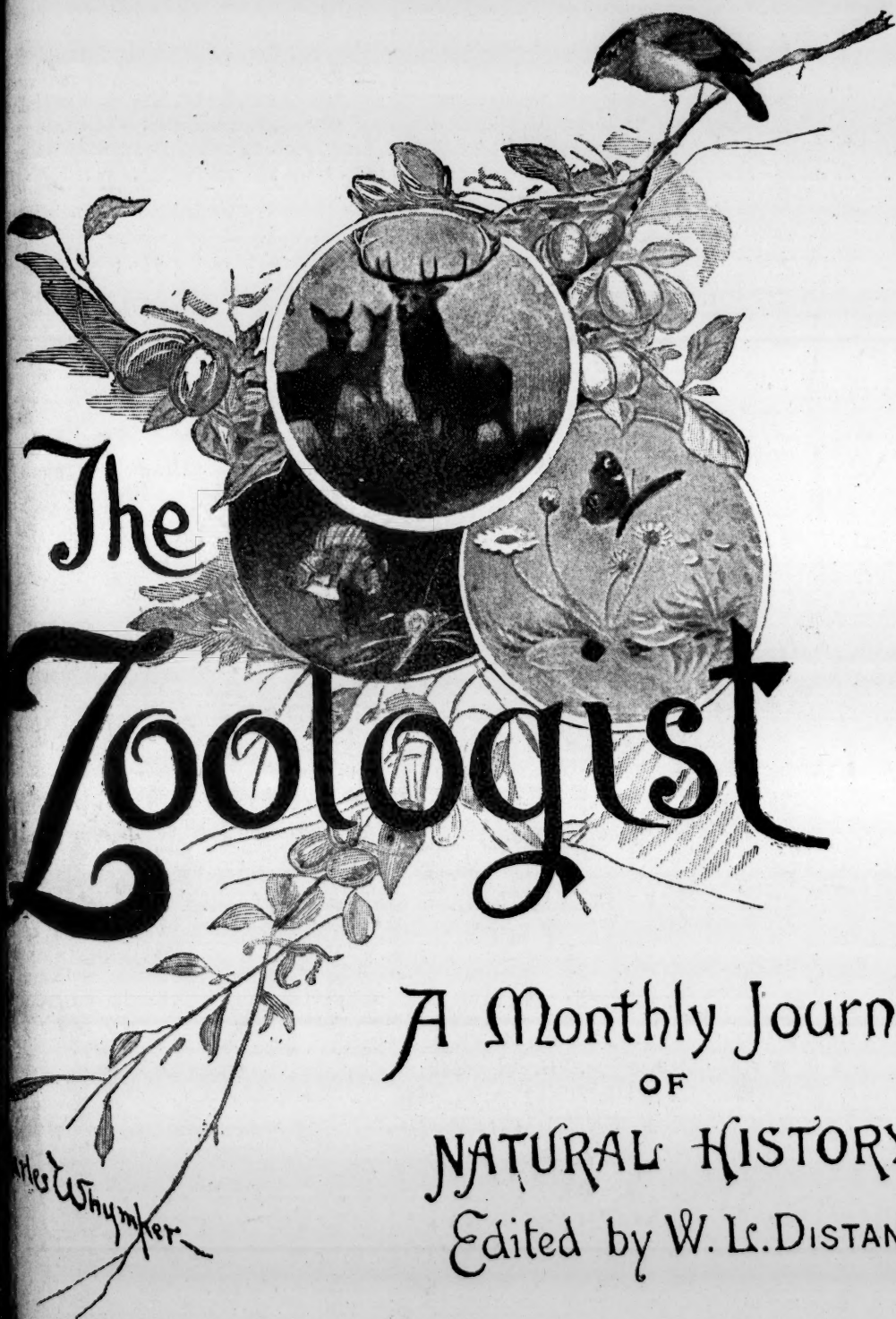
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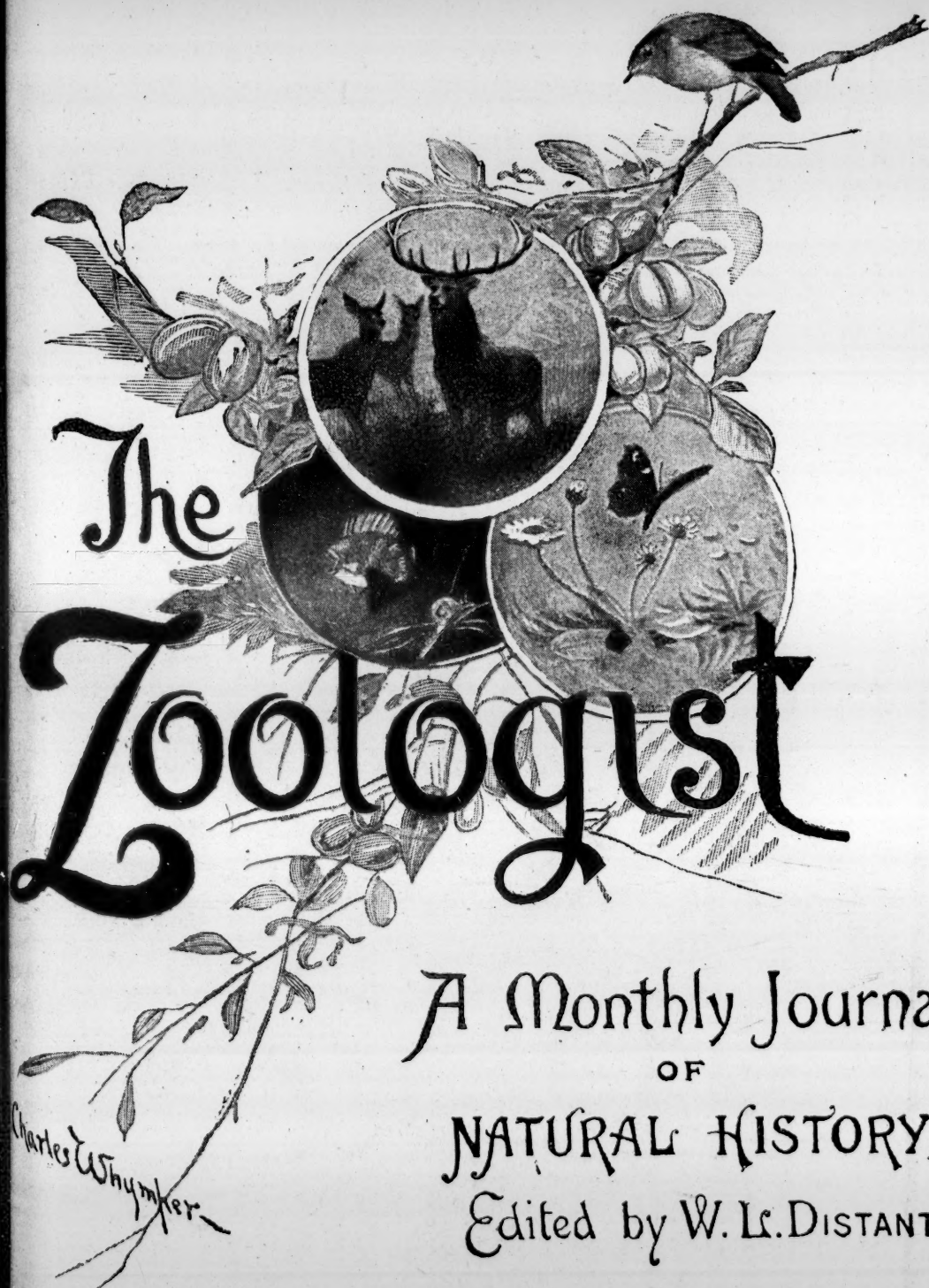
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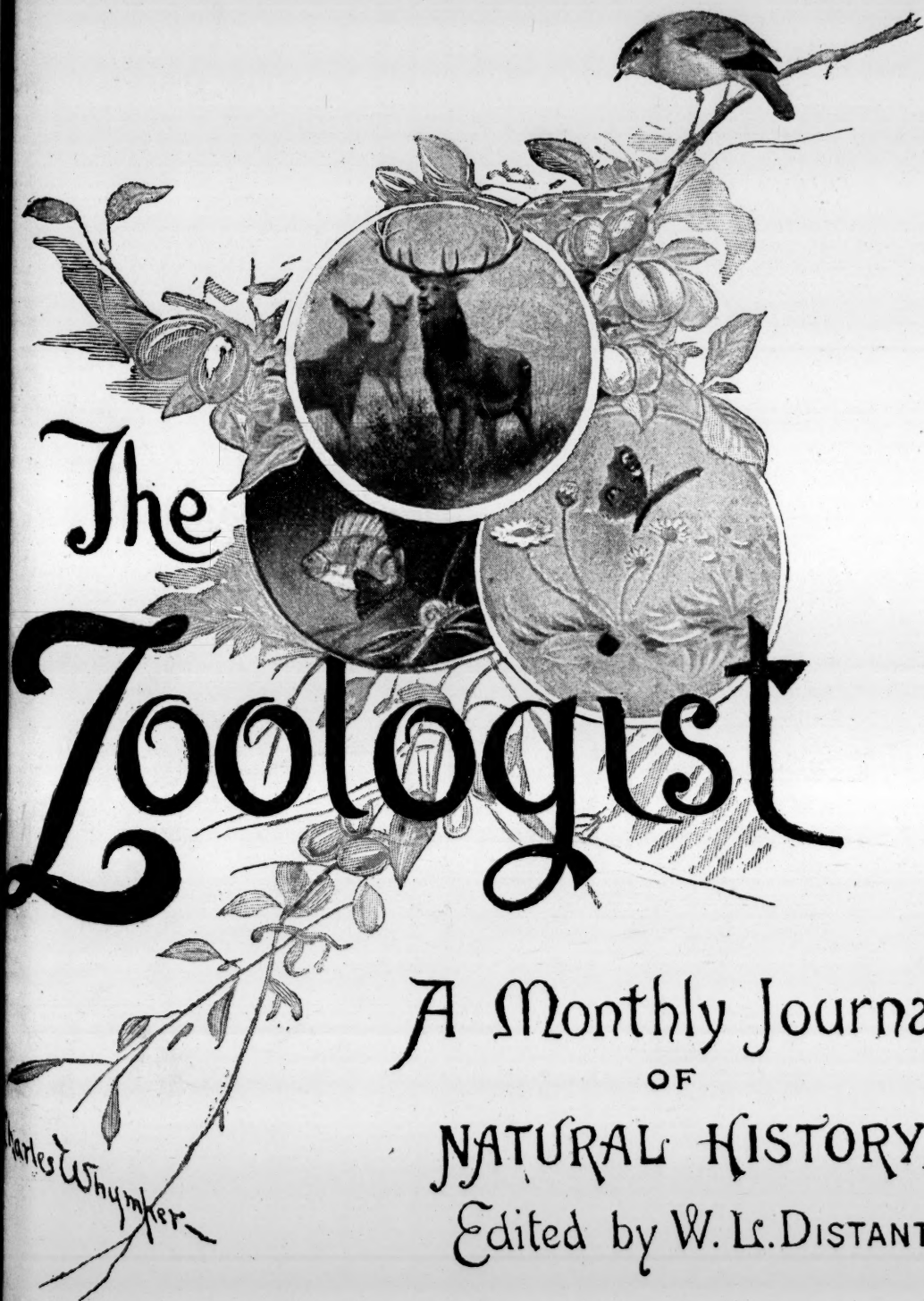
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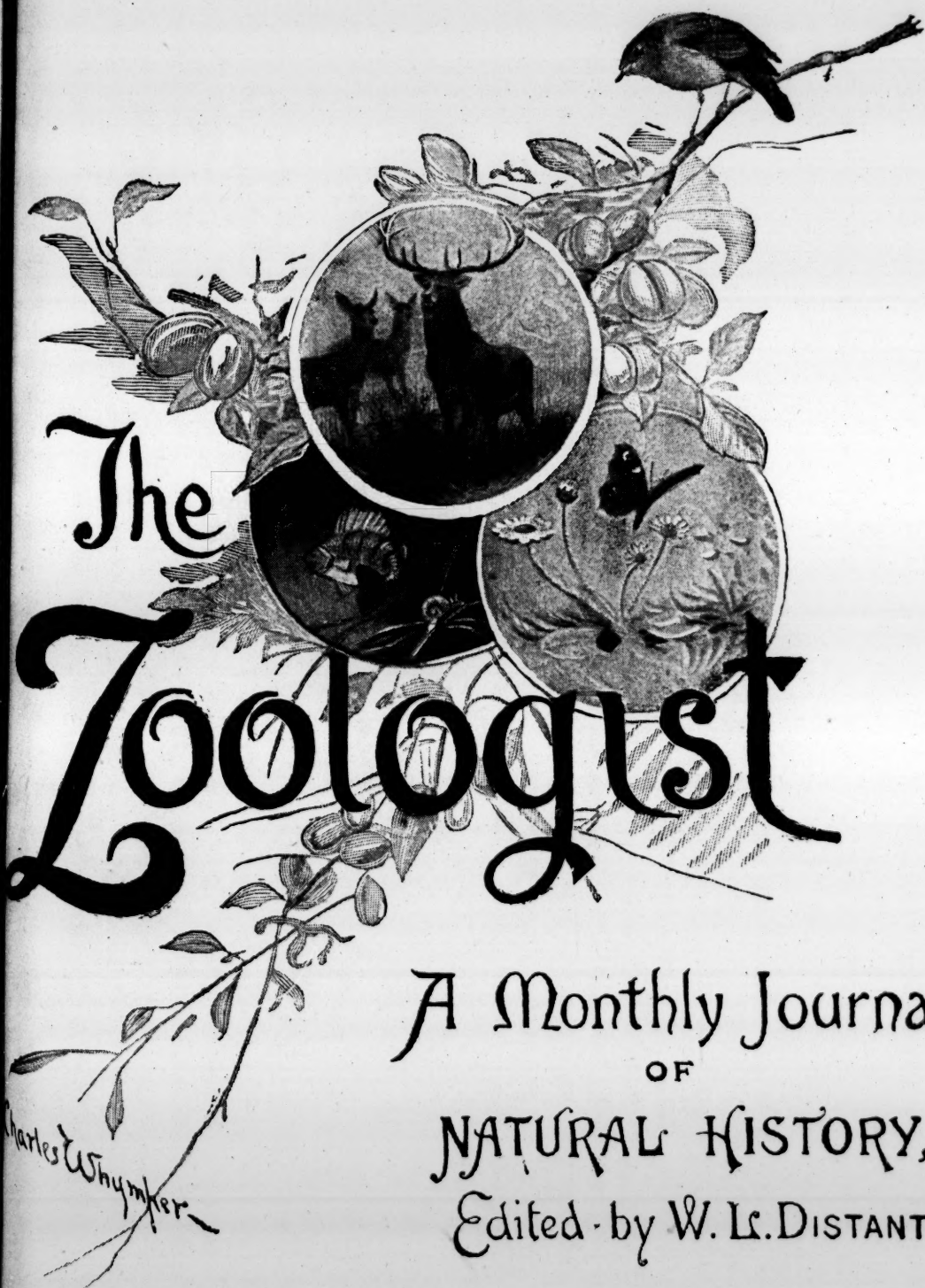
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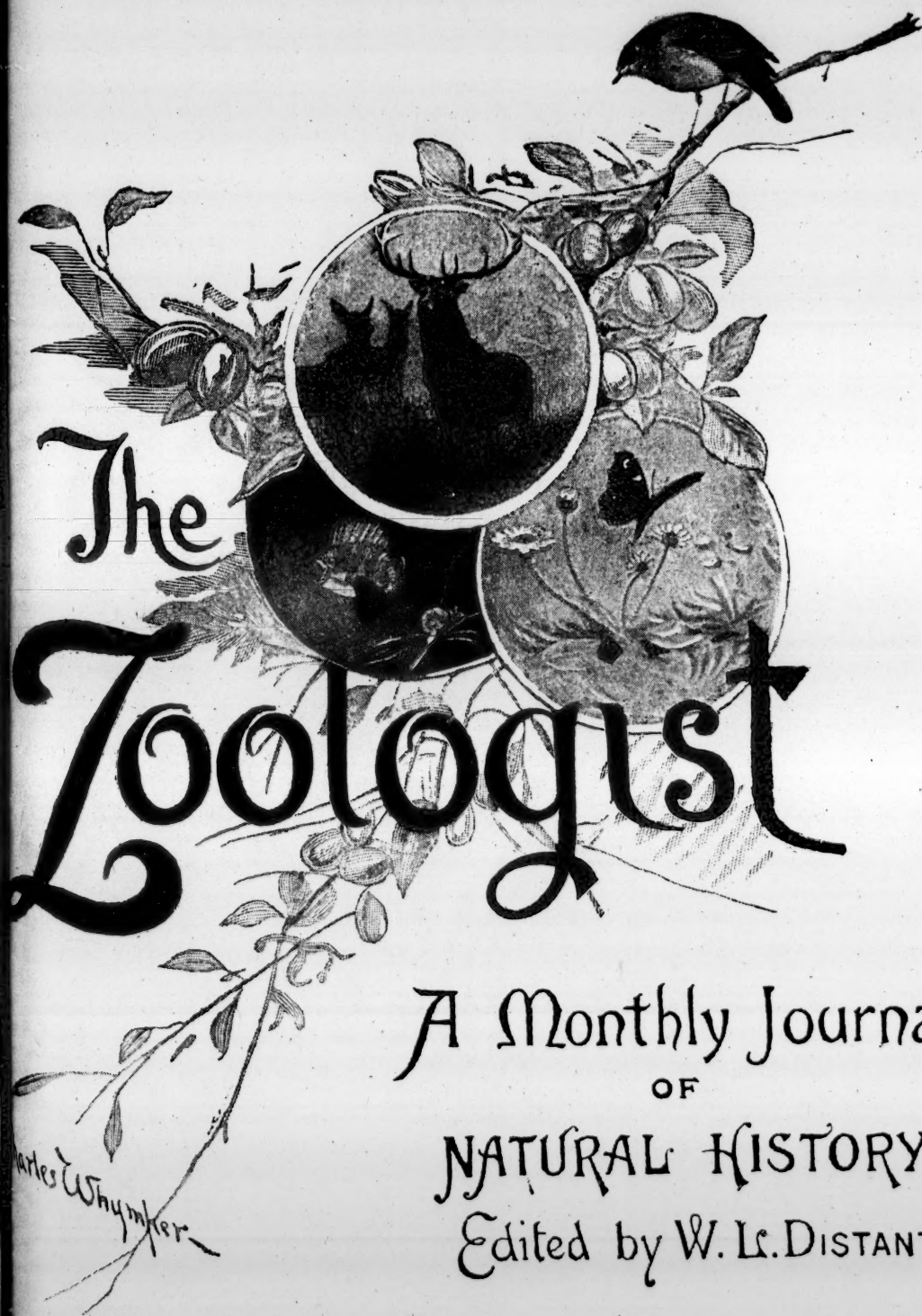
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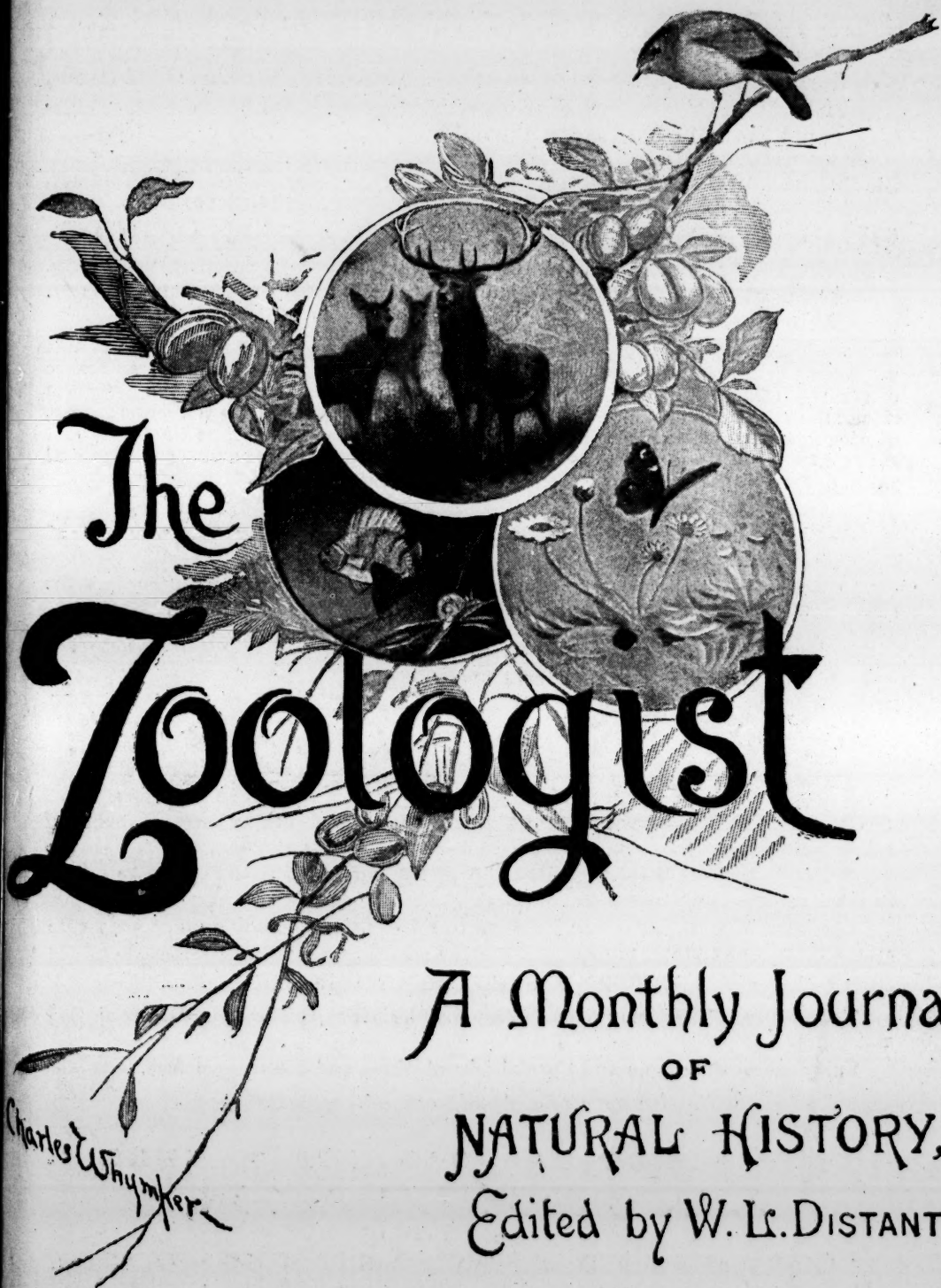
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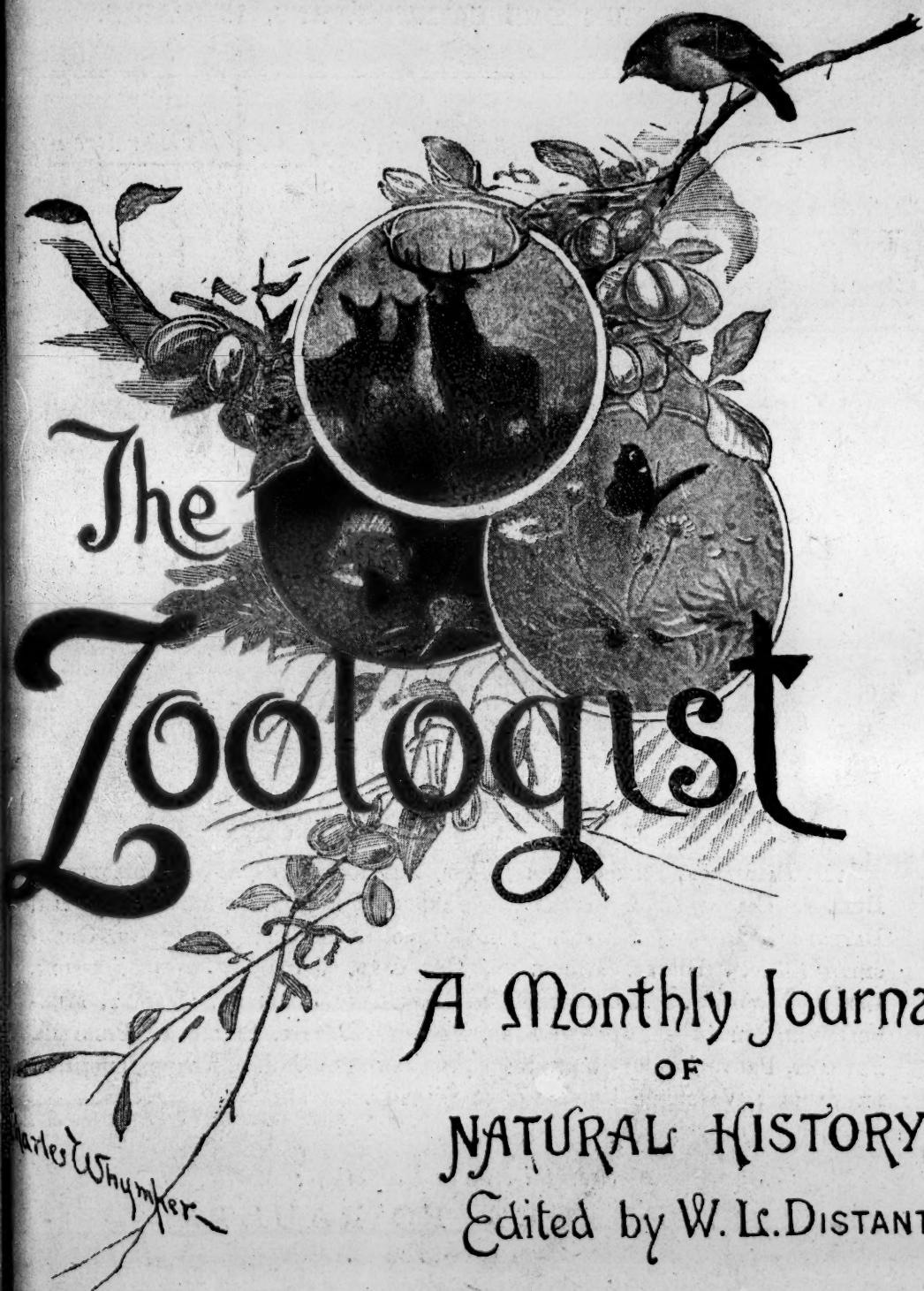
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